Intermec

Installation Guide

**Forklift RFID System
(IV7 and Antennas)**

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Intermec Technologies Corporation.

Contents

Before You Begin

This section provides you with safety information, technical support information, and sources for additional product information.

Safety Information

Your safety is extremely important. Read and follow all warnings and cautions in this document before handling and operating Intermec equipment. You can be seriously injured, and equipment and data can be damaged if you do not follow the safety warnings and cautions.

This section explains how to identify and understand warnings, cautions, and notes that are in this document.

A warning alerts you of an operating procedure, practice, condition, or statement that must be strictly observed to avoid death or serious injury to the persons working on the equipment.

A caution alerts you to an operating procedure, practice, condition, or statement that must be strictly observed to prevent equipment damage or destruction, or corruption or loss of data.

Note: Notes either provide extra information about a topic or contain special instructions for handling a particular condition or set of circumstances.

Global Services and Support

Warranty Information

To understand the warranty for your Intermec product, visit the Intermec web site at www.intermec.com and click **Service & Support** > **Warranty**.

Disclaimer of warranties: The sample code included in this document is presented for reference only. The code does not necessarily represent complete, tested programs. The code is provided "as is with all faults." All warranties are expressly disclaimed, including the implied warranties of merchantability and fitness for a particular purpose.

Web Support

Visit the Intermec web site at www.intermec.com to download our current manuals (in PDF). To order printed versions of the Intermec manuals, contact your local Intermec representative or distributor.

Visit the Intermec technical knowledge base (Knowledge Central) at intermec.custhelp.com to review technical information or to request technical support for your Intermec product.

Telephone Support

These services are available from Intermec.

Services	Description	In the USA and Canada call 1-800-755-5505 and choose this option
Order Intermec products	• Place an order. • Ask about an existing order.	1 and then choose 2
Order Intermec media	Order printer labels and ribbons.	1 and then choose 1
Order spare parts	Order spare parts.	1 or 2 and then choose 4
Technical Support	Talk to technical support about your Intermec product.	2 and then choose 2

Services	Description	In the USA and Canada call 1-800-755-5505 and choose this option
Service	• Get a return authorization number for authorized service center repair. • Request an on-site repair technician.	2 and then choose 1
Service contracts	• Ask about an existing contract. • Renew a contract. • Inquire about repair billing or other service invoicing questions.	1 or 2 and then choose 3

Outside the U.S.A. and Canada, contact your local Intermec representative. To search for your local representative, from the Intermec web site, click **Contact**.

Who Should Read This Manual

This document is written for the person who is responsible for installing an RFID system on a forklift. This document provides guidelines on how to use the parts in this installation kit to install an IV7 and its antennas on a forklift load backrest.

Before you begin this installation, you should be familiar with Intermec RFID products and basic RFID system terminology.

Related Documents

This table contains a list of related Intermec documents and their part numbers.

Document Title	Part Number
IV7 Vehicle-Mount Reader Instructions	075280-*xxx*
IV7 Vehicle-Mount Reader Drilling Template	931-000-*xxx*
IV7 Vehicle-Mount Reader DC Power Cable Kit Instructions	943-000-*xxx*
IV7 Vehicle-Mount Reader Data Cable Kit Instructions	943-067-*xxx*
Intermec RFID System Manual	936-000-*xxx*

The Intermec web site at www.intermec.com contains our documents (as PDF files) that you can download for free.

To download documents

1 Visit the Intermec web site at www.intermec.com.

2 Click **Service & Support** > **Manuals**.

3 In the **Select a Product** field, choose the product whose documentation you want to download.

To order printed versions of the Intermec manuals, contact your local Intermec representative or distributor.

What Is a Forklift RFID System?

A forklift RFID system is a mobile RFID system that is installed on a forklift. The RFID reader (IV7) moves to the RFID tag locations, which differs from a conveyor system where the tags move past a stationary reader.

Components of a Typical Forklift RFID System

- Intermec Vehicle-Mount Computer. For example, a CV60 or a CV30.

- Intermec IV7 Vehicle-Mount RFID Reader with these cables:

  - DC power cable kit for the IV7 (P/N 203-713-*xxx*)

  - Appropriate data (serial) cable for the IV7 that connects it to the vehicle-mount computer (P/N 236-089-001 or Kit P/N 203-776-*xxx*). Other options may be available.

- RFID antennas (up to four) and appropriate cables

- RFID tags

About This Guide

This guide provides guidelines on how to use the parts in this installation kit (P/N 203-769-001) to install the IV7 and its RFID antennas on a forklift load backrest.

Note: Because forklifts, system locations, and other equipment vary from place to place, much of the information in this guide will need to be adapted to your particular installation.

Forklift Installation Kit for an IV7

Description	Quantity
Mounting strap, 18 in long	2
Mounting strap, antenna, 15.0 in long	4
Mounting strap, antenna, 9.0 in long	2
U-bolt, 0.250-20, 0.75 x 4.00 LG	12
Hex nut, self-locking, 0.25-20	48
Cap, polyethylene, 0.25 x 0.50	24
Cap, dust, connector, 0.437 THD	24
Splice, 22/16 AWG, red	30
Clip, cord-adjustable	12
Cable tie, black, 11 in long	14
Cable tie, black, 5.75 in long	12
Corrugated wire loom, slit, 0.6250 ID	12 ft (3.7 m)
Corrugated wire loom, slit, 0.250 ID	25 ft (7.6 m)
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Safety Information

Before you install any Intermec products on the forklift, contact the forklift manufacturer or your vehicle maintenance company to correctly identify the appropriate power connections for the products. Electrical line filters may be required for reliable operation of the RFID system.

You should also contact the forklift manufacturer or your vehicle maintenance company for specific information on appropriate mounting locations for the products.

For more information on power requirements, see the documents that shipped with each Intermec product.

Before You Install the Forklift RFID System

This guide assumes that a pre-sales team has already visited the customer and determined the antennas, tags, and other basic application parameters for the RFID system.

This guide also assumes that the person who is responsible for installing the forklift RFID system is an installer who is knowledgeable on how to modify forklifts. The installer is responsible for contacting the forklift manufacturer or the vehicle maintenance company to correctly identify the appropriate power connections for the products.

Before you begin this installation, you should be familiar with Intermec RFID products and basic RFID system terminology. For help, see the *Intermec RFID System Manual* (P/N 936-000-*xxx*).

Installing the Forklift RFID System

Warning

Consult the vehicle manufacturer or your vehicle maintenance company for specific information on appropriate power connections and mounting locations for this equipment.

Each product comes with specific installation instructions as noted in this procedure. For more informaiton on other required parts or tools, see the installation instructions for each product.

To install the forklift RFID system

1 Install the vehicle-mount computer and its power supply on the forklift. For help, see the documentaiton that shipped with the computer.

2 Mount the IV7 on the forklift load backrest, but do not connect the power cable to power yet. For help using the installation kit to install the IV7, see "Installing the IV7" on page 12.

3 Continue installing the IV7 and connect it to the vehicle-mount computer. For help, see the *IV7 Vehicle-Mount Reader Instructions*.
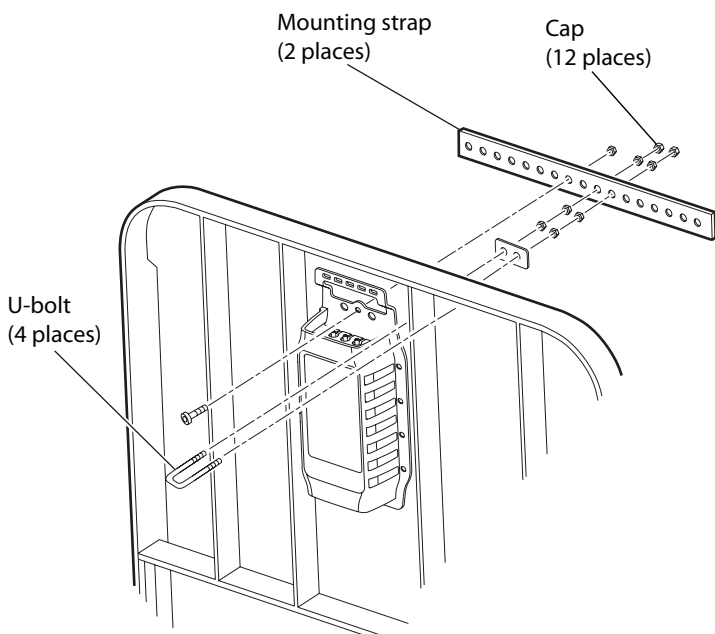
4 Install the RFID antennas on the forklift load backrest. For help using the installation kit, see "Installing the Antennas" on page 14.

For testing purposes, you can temporarily mount the antennas until you find the best locations for permanent mounting. For more information, see "Choosing RFID Antenna Locations" on page 15.

5 Connect the RFID antennas and cables to the IV7. Be sure to leave the installed terminators on any unused antenna ports.

6 Connect the power cable to the IV7. For help, see the *IV7 Vehicle-Mount Reader DC Power Cable Kit Instructions*. The IV7 boots.

7 Complete the installation. For help, see "Completing the Installation" on page 15.

8 (Optional) Create a custom installation document (including pictures) that keeps track of all the variables, including:

- forklift make and model.

- tag application type and read rates for each antenna.

- vehicle-mount computer and IV7 installation on this forklift, including power connections, hole locations, and so on.

Installing the IV7

The installation kit provides you with mounting straps, U-bolts, self-locking hex nuts, and caps. These parts help you install the IV7 on the forklift load backrest.

Tip: It may be easier to install the IV7 if you remove the top bolt on either side of the load backrest. Then, loosen the bottom bolts on either side. Tilt the load backrest back down on the forks. Raise the forks to a comfortable working level.

Mounting strap
(2 places)

Cap
(12 places)

U-bolt
(4 places)

Installing an IV7: *This illustration provides an example of how you can install the IV7 to the forklift load backrest.*

To install the IV7

1 Study the previous illustration.

2 Attach the top of the IV7 to one of the mounting straps (18.0 in). You can either use one screw that is inserted in the center hole of the IV7 baseplate or you can use two screws that are inserted in the outer holes.

3 Use two U-bolts to secure the mounting strap (with the IV7) to the load backrest. You can either mount the IV7 so that it faces the forks or it faces the driver.
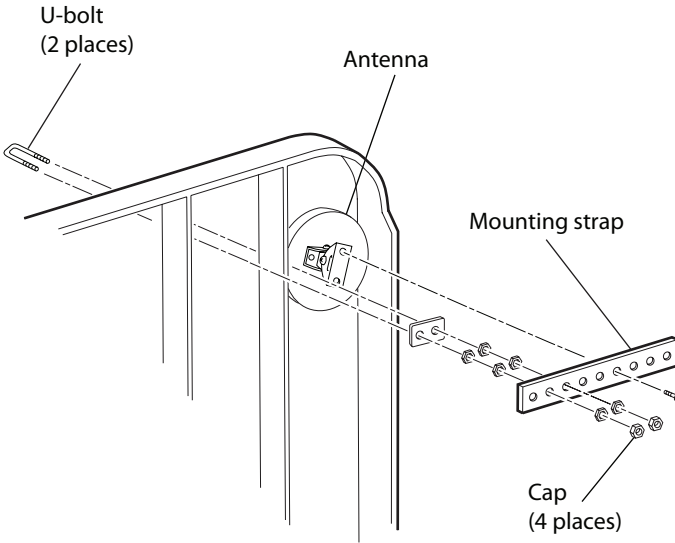
> **Note:** You may need to use extra hex nuts on the U-bolts to ensure that the IV7 does not extend into the area where a pallet or container could damage it.

4 Use two U-bolts to secure the other mounting strap to the load backrest.

5 Attach the bottom of the IV7 to the mounting strap you secured in Step 4.

6 Attach caps to the ends of all U-bolts. You can use either the smaller caps (if the ends are exposed) or the larger caps (if you also need to cover the hex nut).

Installing the Antennas

The installation kit provides you with mounting straps, U-bolts, self-locking hex nuts, and caps. These parts help you install the RFID antennas on the forklift load backrest.

Installing an RFID Antenna: This illustration provides an example of how you can install a smaller antenna to the forklift load backrest. Secure the mounting strap on the side of the load backrest that is facing the driver (so that the antenna faces the forks where the RFID tags will be).

To install the antennas

1 Study the previous illustration.

2 Attach the antenna to a mounting strap. If you are using a larger antenna, you may need to use two mounting straps.

3 Use two U-bolts to secure the mounting strap to the load backrest. Mount the antenna so that it faces the forks (where the RFID tags will be).

> **Note:** You may need to use extra hex nuts on the U-bolts to ensure that the antenna does not extend into the area where a pallet or container could damage it.

4 To install the other antenna, repeat Step 2 and Step 3.

5 Attach caps to the ends of all U-bolts. You can use either the smaller caps (if the ends are exposed) or the larger caps (if you also need to cover the hex nut).

Completing the Installation

The installation kit contains caps, slit corrugated wire loom (two sizes), and cable ties that will help protect the driver and the RFID system.

To complete the installation

1 Verify that all the ends of the U-bolts have caps.

2 Follow the cable safety guidelines in the IV7 instructions.

3 Use the slit corrugated wire loom (0.625 ID) to cover the IV7 power cable and the IV7 serial cable.

4 Use the slit corrugated wire loom (0.250 ID) to cover the RFID antenna cables.

5 Use the clips or cable ties to safely secure all cables to the forklift.

Choosing RFID Antenna Locations

Before you complete the installation, you need to determine the best location for the RFID antennas. Finding the best place on the forklift for the antennas is not always a simple task. The final antenna mounting locations should depend on:
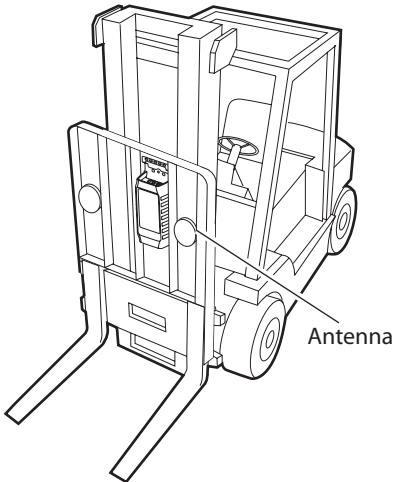
- driver safety factors, especially visibility.

- how protected the antenna will be from collision damage.

- how reliably tags are read.

Once you have figured out the best potential locations for the antennas, you need to mount the antennas on the forklift. Exactly how you mount the antennas depends on many factors, including:

- forklift configuration. Is there space between the spines on the load backrest for mounting an antenna? Is it okay to remove one of the spines to accommodate mounting an antenna?

- customer requirements. Is it okay to drill holes in the sheet metal, or does the installation have to be easily removed?

- operating requirements. Is there a way to temporarily position the antennas until you have tested the RFID system? Then, you can permanently install the antennas.

Mounting On the Forklift Load Backrest

One way to mount antennas for a case tag application involves mounting the antennas on the forklift load backrest.
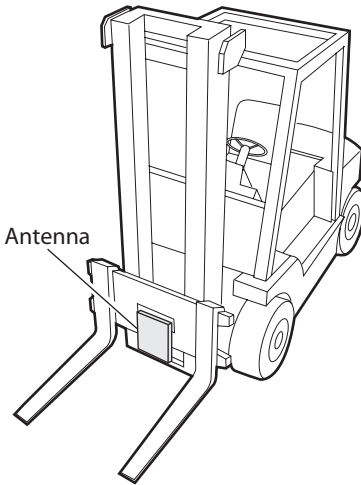

Antenna and IV7 Placement for Load Backrest Mounting: Example of the IV7 and its antennas mounted directly to the forklift load backrest.

In this example, one antenna is mounted directly to the load backrest. The antenna must be kept clear of the load on the pallet. The size and type of load backrest will affect the success of this kind of installation.

You may need to modify the load backrest to protect the antenna from load impact damage. Ideally, the antenna should be recessed in a metal frame.

Mounting Between the Forks

If the application is designed to read pallet tags placed on the bottom of pallets or other containers, you may want to mount the antenns between the forks.

Antenna Placement for Pallet Tag Applications: As the driver raises the forks and the load, the antenna is directly in front of the tags that have been placed in the center on the bottom of a pallet or container.

This approach typically requires mounting the antennas so they can move with the forks. In this case, a riser pulley system can be used to manage the antenna cables. Most forklift manufacturers offer this type of pulley kit.

If just the antennas are mounted on the moving fork assembly, each antenna requires a coaxial cable in the riser pulley system.

If the IV7 is also mounted on the moving fork assembly, the riser pulley system should include a 5-wire cable to support power and communications for the IV7.

You may need to modify the load backrest so that the mounted antennas and IV7 are protected from collisions with the load or containers.

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